

THE AGROSTIS FLORA OF EAST ANGLIA

Agrostis is one of the most easily recognisable grass genera found in the region. Its members are perennial grasses, flowering mostly between mid-June and late July. They possess delicate panicles, diffuse at anthesis but frequently contracted before and after flowering. Their spikelets are one-flowered and small, with the often reddish-brown glumes completely concealing the delicate lemma and other floral parts, except at anthesis. Two genera with one-flowered spikelets which could be confused with *Agrostis* are *Apera* and *Calamagrostis*. However, the two *Apera* species are annuals and their lemmas bear longer awns (≥ 5 mm) than any found in *Agrostis* species. The three East Anglian *Calamagrostis* taxa have lemmas surrounded by long silky hairs at their bases, a feature not found in *Agrostis*.

While *Agrostis* as a genus is easily recognised the species within it are not. Clive Stace, in *New Flora of the British Isles* (Second Edition), Cambridge University Press, 1997, lists eleven species of which the following six are likely to be met with in East Anglia: *Agrostis capillaris*, *A. stolonifera*, *A. gigantea*, *A. vinealis*, *A. canina* and *A. castellana*. This exhibit concentrates on these and how to distinguish them, although two further casuals are displayed for interest.

To gain familiarity with the *Agrostis* species, one should examine fresh material in the field, ideally at anthesis. Many helpful features become less clear in herbarium material as the accompanying specimens illustrate. The most important elements in species determination are: presence or absence of palea, presence of awns, ligule length and mode of growth (rhizomatous or stoloniferous). Each of the six taxa named above will now be considered in turn in relation to these features with additional supporting information supplied as well.

A. capillaris: Palea c 2/3 length of lemma; lemma awnless; ligule very short (< 0.5 mm on lowest blade of tillers); rhizomatous with slender rhizomes similar in thickness to those of *Poa pratensis*. Panicle not contracting after flowering. Found principally in light, neutral to acid soils.

A. stolonifera: : Palea c 2/3 length of lemma; lemma awnless; ligule on tillers ≥ 1 mm; stoloniferous. Panicle narrow, contracted before and after flowering. Some panicle branches bear spikelets almost to the base. This is the commonest and most variable of the *Agrostis* species, occurring in all types of soil. Peter Sell, in *Flora of Great Britain and Ireland*, Volume 5, Cambridge University Press, 1996, lists five ecological varieties, but only var. *palustris* seems worthy of recognition and is exhibited here. This variety is robust, often sprawling in wet places and fails to form a stoloniferous turf. It can reach 1m in height.

A. gigantea: Palea c 2/3 length of lemma; lemma awnless; ligule on tillers ≥ 1 mm; rhizomatous with stout rhizomes resembling those of *Elytrigia repens*. The panicle is typically long and broad, contracted before and after flowering. *A. gigantea* is a grass of disturbed soils so is frequent in arable fields (especially among cereals). It cannot compete in stabilised communities and vanishes within five years of the cessation of cultivation.

A. vinealis: Palea absent; lemmas awned or awnless (both lemma types often present in the same sward); ligule long, on culms ≥ 3 mm, pointed; rhizomatous with

often short, slender rhizomes resembling those of *Poa pratensis* in thickness. Panicle contracted before and after flowering. A plant of sandy, acid heaths, often very abundant in suitable habitats. If awns are present *A. capillaris*, *A. stolonifera* and *A. gigantea* are at once eliminated.

A. canina: Palea, lemma, ligule and panicle as in *A. vinealis*. Markedly stoloniferous with tillers bearing narrow leaf blades usually c 1mm wide forming a delicate turf. A plant of acid ditches or on acid grassland in places where water stands in winter.

A. castellana: Diagnostic characters are exhibited only by the lemmas of the spikelets at the ends of the panicle branches. In these spikelets palea c 2/3 length of lemma; lateral nerves of lemma prolonged into 2 awnlets, lemma often awned from the base, frequently hairy on the back and with a tuft of minute hairs at the base; uppermost culm ligule c 3mm (distinctly longer than that of *A. capillaris* which the species often resembles); mode of growth indeterminate. Panicle somewhat contracted before and after flowering. Seeds of this species are often a constituent of lawn seed mixtures and it mostly occurs in urban situations, at the edges of lawns, in pavement cracks and along newly sown road verges. The awns in the terminal spikelets if present (with all other lemmas awnless) are diagnostic. If all lemmas are awnless identification is difficult although the lemma nerve awnlets in the terminal spikelets are reliable. One useful feature is early heading. Any *Agrostis* plant in panicle before mid-June is very likely to be referable to this species.

In conclusion, the following additional observations may be helpful. Confident naming often depends on digging up the plant. Depauperate *A. gigantea* can seldom be determined without checking for its stout rhizomes.

Flowering times are a guide but there is much overlap.

The following is a rough sequence relating to south-east England:

A. castellana: early to late June;
A. vinealis, *A. canina*: mid-June to early July;
A. capillaris, *A. stolonifera* : late June to mid-July;
A. gigantea : mid-July to early August.

Where *A. vinealis* and *A. capillaris* grow together *A. vinealis* will be ripening seed when *A. capillaris* is at anthesis. Where *A. canina* and *A. stolonifera* occur together *A. canina* will similarly precede *A. stolonifera*.

Examination of lemma and palea is facilitated if the inflorescence is collected at anthesis and allowed to dry for a few days. The florets can then usually be teased out from the glumes by gentle probing with a dissecting needle or tip of a fine knife blade.

Hybrids between various species have been recorded. Most are sterile and rare and will not be considered here.

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AGROSTIS IN SCOTLAND

The accompanying exhibit was originally prepared in 2009 for display at the Essex Field Club annual Exhibition and Social. The information in the associated handout (The *Agrostis* flora of East Anglia) will be largely valid in Scotland but a few cautionary observations are desirable.

In southern England the taxa *Agrostis vinealis* and *A. canina* occupy markedly distinct habitats, dry acid heath and damp to wet acid ground, respectively. In Scotland *A. vinealis* can be found in much wetter places than is the case further south, as I first observed in Inverness-shire in the 1960s. It is therefore most important to examine the rootstock before naming a specimen. The presence of rhizomes indicates *A. vinealis* and that of stolons *A. canina*. This is the only reliable morphological feature separating the taxa. The ligule differences given by Stace (2010) are too subtle to be usefully diagnostic. Furthermore the shoots in the axils of the leaves depicted in the illustration in Hubbard's "Grasses" are often not present, whereas they can occur also in *A. stolonifera*, especially late in the season.

The adaption of *A. vinealis* to wetter habitats appears to be at its most extreme in Shetland. As Walter Scott and Richard Palmer point out in 'The flowering plants and ferns of the Shetland Islands', "All Shetland material of the *A. canina* aggregate, even from the wettest places, appears to belong to this species (*A. vinealis*)".

The other species likely to create identification problems is the immensely variable *A. stolonifera*. The extreme forms of *A. stolonifera* var. *stolonifera* and *A. stolonifera* var. *palustris* are distinct enough, but there are intermediates best considered just as *A. stolonifera* s.l..

The approximate flowering times given in the handout are up to two weeks earlier than would be the case in Scotland, but the sequence of flowering is likely to be the same.

Despite the guidance given by this exhibit, be prepared to encounter specimens which cannot be named with certainty, maybe because of hybridisation or atypical growth. *Agrostis* is a difficult genus!

REFERENCES

- Hubbard C.E., Grasses (Third edition) 1984. Penguin Books Ltd.
- Scott W. and Palmer R., The flowering plants and ferns of the Shetland Islands 1987. The Shetland Times Ltd, Lerwick.
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